

## Searching for Mars' Missing Atmosphere

Transcript:

[ music ] So a real outstanding question is, what was the early atmosphere of Mars like, and for how long did it last, and did the conditions on Mars early on that might have been favorable for life persist for hundreds of millions of years, for tens of millions of years, for how long exactly did they persist? So the MAVEN mission is designed to really get at the climate history of Mars. My name is Paul Mahaffy. I'm Chief of the Planetary Environments Lab in the Solar System Exploration Division of NASA Goddard Space Flight Center. MAVEN is a Mars orbiter, not designed to take pictures of Mars, but really with chemical sensors to understand how the present atmosphere is escaping from Mars, and then through modeling try and extrapolate that back in time, and try to understand whether the ancient atmosphere of Mars was similar or different than it was today. MAVEN stands for Mars Atmosphere and Volatile Evolution mission. The NGIMS experiment on MAVEN is the Neutral Gas and Ion Mass Spectrometer, we have an acronym for everything here at NASA, and this experiment is a quadrupole mass spectrometer with two ion sources designed to look at both neutral gases and ions in the upper atmosphere of Mars. In fact as we dip down into the atmosphere, we will measure the altitude variation of those chemical constituents, we'll look for the composition, we'll look for how that composition changes with solar events like big solar flares and solar activity, and we'll do that for a whole Earth year on many, many orbits around Mars. The closest place we can look in our solar system, the place that we can get to easiest, that has an atmosphere, that has evidence for past water on the surface, is Mars. If the ancient atmosphere of Mars was much heavier, the potential of Mars to support life might have been much more favorable. And so the MAVEN mission is designed to really let us understand current escape processes on Mars, and then extrapolate back to very ancient Mars to try to understand the conditions that were present back then. [ music, beeping ]